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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,430

01/30/2007

James K. Gimzewski

UCLA-013

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EXAMINER

SIEFKE, SAMUEL P

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,430	<b>Applicant(s)</b> GIMZEWSKI, JAMES K.	
	<b>Examiner</b> SAM P. SIEFKE	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-9 and 11-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Manalis (USPN 2004/0038426).

Manalis discloses an analytical cell 100 in a U-shaped configuration, free-standing microfluidic channel 110 defined as a hollow within an elongated, finger-like cantilever 115 that projects from (and is integral with or joined to) a mechanically stable supporting substrate 120. Fluid flowing through a channel within the substrate enters the cantilever 115 and traverses the channel 110 as indicated by the arrows (fig. 1 ). In one configuration, calorimetric measurements are accomplished by detecting the bending of a thermal bimorph. As shown in FIG. 2, the bimorph comprises the cantilever 115 containing a microfluidic channel 110 and a material (e.g., a metal, such as gold or aluminum) 210 that is deposited on the exterior surface of the cantilever 115. The material 210 has a coefficient of thermal expansion different from that of the

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cantilever 115. As a result, a temperature change leads to unequal thermal expansion, which causes the structure (i.e., the metal-treated cantilever 115) to bend. This temperature change arises from reaction between different species within the channel 110. The different species may be free, reacting as the sample passes from a source channel 215 into and through the channel 110. Alternatively, however, one (or more) of the species may be bound within channel 110. In one embodiment, the bound species is attached to surfaces (e.g., interior walls and/or structures within the channel, as described below). In another embodiment, the bound species is suspended within a gel that fills channel 110. In each case, a potential difference may be established through the channel, and species of interest caused to circulate through the channel electrophoretically.

### ***Response to Arguments***

Applicant's arguments filed 4/20/10 have been fully considered but they are not persuasive. Applicant argues, "Manalis does not teach, or even suggest, using a calorimeter tube having an inlet end and an outlet end, wherein the calorimeter tube is mounted onto a support at the inlet end and the outlet end." Claim 1 requires that the inlet end and outlet end are mounted onto a support at the inlet end and the outlet end. Looking at figure 1 and 2 of Manalis, the inlet end is the area before the inlet arrow in figure 1 which is mounted onto support (dark area). The outlet end is the area after the outlet arrow in figure 2 which is mounted onto support (dark area). In column 7, lines

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20-39, Manalis states, at least one suspended beam 12 connected to two mechanically stable supports 14a and 14b, wherein the beam contains one or more microfluidic channels 16, and one or more detectors (not shown). In an alternative embodiment, the beam may be a cantilever (see fig. 2). The later embodiment is the illustration that is portrayed in the instant invention.

Regarding claim 12, Manalis shows an array of cantilevers in figure 4.

Regarding claim 15, Manalis introduces a sample into the device, see claim 1.

Applicant argues, "Applicant has rewritten originally filed claim 2 in independent form as new claim 21. Applicant points out that Manalis does not teach, or even suggest, a sensor that detects temperature input into the reaction vessel and/or temperature output from the vessel required to maintain the reaction vessel at a substantially constant temperature." Manalis discloses detecting changes in mechanical resonant frequency, or changes in bending, to detect a change in temperature). When a specimen is passed through the microfluidic channel of Manalis, the species reacts with a bound analyte within the channel. A temperature change due to the reaction between the species and the bound analyte leads to an unequal thermal expansion between the two layers of the cantilever which causes the structure to bend. When the structure bends a detector (sensor) picks up on the magnitude of the bending which corresponds to the heat transferred during the binding reaction. When a species does not interact with a bound analyte no bending occurs, this would be the instance when the microfluidic channel is at a substantially constant temperature.

Regarding claim 27, the microfluidic volumes are discussed in para. 62, which states 1 ul for total sample volume within the reaction vessel.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAM P. SIEFKE whose telephone number is (571)272-1262. The examiner can normally be reached on M-F 9:00am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Samuel P Siefke/  
Primary Examiner, Art Unit 1797